Solar-Assisted Charging Station for Electric Vehicles Project

TVA is working with the Electric Power Research Institute, Oak Ridge National Laboratory and local power distributors to deploy solar-assisted electric vehicle charging stations in Knoxville, Nashville and Chattanooga.

The solar-assisted stations will complement the non-solar residential, commercial, public and fast-charging infrastructure network that the Electric Transportation Engineering Corporation (eTec) is developing as part of a multi-region project to support the launch of the Nissan LEAF battery electric vehicle in late 2010.

Why develop solar-assisted charging stations?
The increased use of electricity as a transportation fuel requires effective integration of charging stations with the power grid. TVA is supporting the development of solar-assisted stations to increase the use of renewable energy in the Valley; provide electric vehicle owners with a greener charging option; reduce the likelihood of negative impacts from charging vehicles during periods of peak power demand; defer costly system upgrades; and support system reliability.

What does the stationary battery do?
Stationary battery storage will provide additional localized grid support to mitigate the impacts of charging multiple vehicles in one centralized location. Stationary storage will also provide future opportunities to re-use automotive batteries that are no longer ideal for vehicles. These batteries may have 60-70 percent life left in them and can be used to support the power grid.

How will a solar-assisted station look?
The solar-assisted stations will use a modular design of solar panels (typically as a canopy over the parking space) that incorporates stationary battery storage at certain sites; a vehicle charging device known as an EVSE (Electric Vehicle Supply Equipment); a communications and control system; data collection equipment; a dedicated transformer; and connection to the local power grid.

What is a modular design?
The stations are designed in blocks, or modules. The basic two-vehicle charging station module can be scaled up to a station with spaces for 10 or more vehicles.

Where will the prototype be built?
The first prototype will be built at the EPRI Laboratories for Electric Transportation Applications off Dutch Valley Road in Knoxville, followed by a second on the campus at ORNL. Using the best practices gleaned from the prototypes, the regional deployment will be expanded to sites in Knoxville, Nashville and Chattanooga.

Where will a solar-assisted station be located in Knoxville?
We are working with city officials and the Knoxville Utilities Board to determine a specific site; however, the likely location will be an area with high traffic patterns, such as downtown or near the University of Tennessee campus.

When will the testing begin?
Testing of the first prototype is expected to begin by June to gather data to support the LEAF launch in late 2010. Other non-solar stations will be placed in the region by eTec during 2010 and early 2011 to match the Nissan LEAF launch.

What is the duration of the Project?
The regional deployment project is a multi-year scenario ending in 2012. The infrastructure to generate solar electricity and charge vehicles will be in place for many years.

Will the solar-assisted stations accommodate other makes of cars beside the Nissan LEAF?
Yes. The station design will use the standard J1772 plug designated by the Society of Automotive Engineers that will accommodate all future plug-in vehicles manufactured for the U.S., including the Chevy Volt and the Toyota Prius plug-in hybrid electric vehicles.

Are ORNL, TVA and EPRI endorsing the LEAF over other makes?
No. We welcome the opportunity to partner with Nissan and others to support this new era of technology in American transportation.

Who is involved in the Electric Vehicle (EV) project with eTec and Nissan?
The U.S. Department of Energy, the state of Tennessee; Oak Ridge National Laboratory; the Tennessee Valley Authority; the Electric Power Research Institute; the cities of Knoxville, Chattanooga and Nashville; the Knoxville Utilities Board, Nashville Electric Service and EPB (Electric Power Board) of Chattanooga

For more information, please visit the EV Project Web site at www.theevproject.com